

Orange rust of sugarcane - *Puccinia kuehnii*

The two major rust fungi on sugarcane are brown rust caused by *Puccinia melanocephala* and orange rust caused by *P. kuehnii*. While brown rust is relatively common, the range of orange rust has expanded recently and now infects the sugarcane-growing regions in the southeastern United States, Central and South America, and the Caribbean Basin (Comstock et al. 2008, personal communication).

Puccinia kuehnii Butler 1914

Spermogonia and aecia unknown.

Uredinia primarily hypophyllous (on lower surface of leaves), orange to reddish-brown, linear up to 4 mm, urediniospores obovoid or pyriform or broadly ellipsoidal, 33-53 × 21-31 µm, orange to cinnamon-brown, echinulate, germ pores 4-5, equatorial, wall 1-2.3 µm; paraphyses inconspicuous, sometimes absent, hyaline to pale brown, pyriform to clavate, 24-60 µm long, 6-14 µm head, wall thin, >1 µm.

Telia hypophyllous, translucent, teliospores 2-celled, hyaline, 31-55 × 10-17 µm, smooth, fusiform to clavate, walls uniform, 0.5-1.2 µm, sessile or pedicels thin-walled, hyaline, up to 12 µm long; telial paraphyses absent.

Host range: Primarily on species of *Saccharum* in the Poaceae, specifically *Saccharum arundinaceum* Retz., *S. barberi* Jeswiet, *S. edule* Hassk., *S. narenga* (Nees ex Steud.) Wall. ex Hack., *S. officinarum* L., *S. rufipilum* Steud., *S. ravennae* (L.) L., *S. sinense* Roxb., *S. spontaneum* L., *Sclerostachya fusca* (Roxb.) A. Camus.

Geographic distribution:

Widespread in Asia and Australia. Recently discovered in western Africa and the Western Hemisphere and now known from the sugarcane-growing regions in the southeastern United States, Central and South America, and the Caribbean Basin (Comstock et al. 2008, personal communication). Questionable report from South Africa.

See Mordue (1985) and Virtudazo et al. (2001) for a more detailed description.

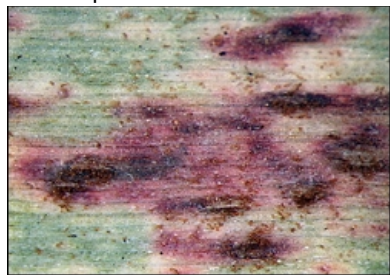
Though highly variable in size, orange rust urediniospores are typically larger than brown rust, although the size ranges overlap. Orange rust is distinct from brown rust in producing uredinia with inconspicuous paraphyses. When paraphyses are present, they are extremely thin walled and hyaline. Urediniospores are orange to reddish-brown with apical wall thickenings. Teliospores are hyaline with uniformly thin walls, and may or may not be sessile. Telial paraphyses are absent. Like brown rust, spermogonia and aecia are unknown.

Here is a [link](#) to a chart comparing *Puccinia kuehnii* and *Puccinia melanocephala*.

References:

- Comstock, J.C., Sood, S.G., Glynn, N.C., Shine Jr., J.M., McKemy, J.M., and Castlebury, L.A.** 2008. First Report of *Puccinia kuehnii*, Causal Agent of Orange Rust of Sugarcane, in the United States and Western Hemisphere. *Pl. Dis.* 92: 175.
- Mordue, J.E.M.** 1985. Urediniospore ornamentation in the sugarcane pathogens *Puccinia kuehnii* and *P. melanocephala*. *Trans. Brit. Mycol. Soc.* 84: 758-760.
- Saumtally, A.S., Viremouneix, T.R., Ahondokpe, B., Castlebury, L.A., Dixon, L., Glynn, N.C., and Comstock, J.C.** 2011. First report of orange rust of sugarcane caused by *Puccinia kuehnii* in Ivory Coast and Cameroon. *Pl. Dis.* 95: 357.
- Virtudazo, E.V., Nojima, H., and Kakishima, M.** 2001. Taxonomy of *Puccinia* species causing rust diseases on sugarcane. *Mycoscience* 42: 167-175.

Under the dissecting microscope, orange rust pustules are bright orange and surrounding necrotic tissue is reddish/pink.



Paraphyses are lacking in uredinia of *P. kuehnii*, whereas they are abundant in those of *P. melanocephala*.

